APPENDIX E

DOE DIRECTIVES CITATIONS RELEVANT TO THE CBDPP

CROSSWALK TO APPLICABLE DOE DIRECTIVES

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The following matrix provides a crosswalk of the guidance provided in G 440.1-7 to those DOE Directives (Orders, Notices, and Guides) and DOE Technical Standards relating to the CBDPP.

DOE G 440.1-7 Paragraph No.	DOE *	Requirement and Associated Guidance
III.2.1 Written Program	O 440.1	4.a. and Attachment 2, 1: Implement a written worker protection program that:..provides a place of employment free from recognized hazards that are causing or are likely to cause death or serious physical harm to their employees; and...integrates all requirements contained in paragraphs 4a through 4l of this Order; program requirements, contained in Title 29 Code of Federal Regulations (CFR) Part 1960, "Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters"; applicable functional area requirements contained in Attachment 1; and other related site-specific worker protection activities. 4.b and Attachment 1, 2: Establish written policy, goals, and objectives for the worker protection program. Attachment 2, 18.a.(2): A formal, written contractor occupational medical program detailing the methods and procedures used to implement the occupational medical requirements necessary for worker protection and the promotion of a healthful work environment shall be established, maintained, reviewed, and updated.

	N 440.1	4.b.: Include in the CBDPP written plans, schedules, and other measures for achieving the objectives and requirements of this Notice. The program shall address, at a minimum, the following elements: baseline inventory and sampling, hazard assessment, medical surveillance, exposure monitoring, training, exposure reduction and minimization, recordkeeping, and performance feedback. Attachment 1, 4.a. and Attachment 2, 6.d.(1): Developing a documented program that includes exposure reduction and minimization goals using a risk-based (tailored) approach, a plan for meeting goals, measures that will be used to assess status of attaining goals, and the rationale for determining reduced and minimized exposures. Attachment 1, 4.e.: Documenting the rationale used for determining reduced and minimized exposures. Attachement 2, 3.: Include in the CBDPP written plans, schedules, and other measures for achieving the objectives of DOE Notice 440.1 and requirements of this CRD. The program shall address at a minimum, the following: baseline inventory and sampling, hazard assessment, exposure monitoring, medical surveillance, training, exposure reduction and minimization, recordkeeping, and performance feedback. The CBDPP shall be approved by the contractor's site senior health and safety executive and the Head of the DOE Field Organization.
III.2.2 Occupational Exposure Limits	O 440.1	4.l(1): Comply with the following worker protection requirements: American Conference of Governmental Industrial Hygienists (ACGIH), "Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices" (most recent edition), when ACGIH Threshold Limit Values (TLVs) are lower (more protective) than Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits. [When ACGIH TLVs are used as exposure limits, DOE operations shall nonetheless comply with the other provisions of any applicable OSHA-expanded health standard.] The TLVs for exposures to laser emissions in the ACGIH Indices are excluded from this requirement. Attachment 2, 12.a,e: Comply with the following worker protection requirements: a. Title 29 of the Code of Federal Regulations (CFR), Part 1910, "Occupational Safety and Health Standards," . . . e. Title 29 CFR, Part 1926, "Safety and Health Regulations for Construction."
	N 440.1	Attachment 1, 4.b. and Attachment 2, d.(2).: Using administrative action levels that trigger actions to reduce or minimize worker exposure and the potential for exposures.
	G 440.1-3	4.3.2.2: The Administrative Control Limit is a useful statistical tool for providing confidence that exposures are acceptable. Usually, an initial ACL set at 10% of the OEL is used until sufficient data are obtained to generate a statistically valid exposure profile. (See Appendixes B, C, and D, and the *AIHA Exposure Assessment Strategy* document for a discussion of "trigger points" and details on obtaining statistically significant sampling.) If the ACL is not exceeded, then it can be reasonably assumed that the actual exposures are acceptable with respect to the OEL and additional exposure monitoring may not be needed

III.2.4 Teaming	O 440.1	4.e.: Encourage the involvement of employees in the development of program goals, objectives, and performance measures and in the identification and control of hazards in the workplace. Attachment 2, 17.g.: Coordination with cognizant occupational medical, environmental, health physics, and work planning professionals. Attachment 2, 18.a.(4): To carry out this goal, the contractor occupational medical professional staff shall participate as members of a worker protection team.
	Std-xxxx-97	5.2: DOE elements and contractors are required to coordinate industrial hygiene efforts with planning and design personnel to anticipate and control health hazards that proposed facilities and operations would introduce. Industrial hygiene evaluations should include input from organizations and disciplines impacting and impacted by potentially hazardous operations. These disciplines include occupational medicine, epidemiology, occupational safety, fire protection, radiation protection, environmental protection, maintenance, operations, and engineering. Review at the conceptual design phase, the earliest phase of the project, is critical. This is the phase where recommendations can be most easily incorporated and when the role of the industrial hygienist in the processed is most easily established. 5.6: Line workers have a vested interest in the Worker Protection Program—they are the persons most in contact with the hazards. As such, they serve a svaluable problem solvers. Workers who are trained and allowed to develop and implement ideas are more likely to support them. They have a personal stake in ensuring that rules are followed. 5.7: Coordination must be established, maintained, and documented between the industrial hygienists and other organizations' personnel in the facility to ensure successful implementation of the Worker Protection Program. These organizations include, but are not limited to, occupational medicine, epidemiology, occupational safety, environmental protection, fire protection, radiation protection, purchasing, maintenance, engineering, operations, and contracting. For example, the senior industrial hygienist should recommend employees to be included in medical surveillance and should participate in the review of occupational exposure and medical surveillance data.
III.2.5.1	N 440.1	Attachment 1, 4: Exposure Reduction and Minimization. Manage and control exposures to beryllium by: reducing airborne levels of beryllium, minimizing the number of workers exposed and potentially exposed to beryllium, minimizing the number of opportunities to be exposed, and setting reasonable exposure reduction goals using a risk-based (tailored) approach. Attachment 1, 4.a: Developing a documented program that includes exposure reduction and minimization goals using a risk-based (tailored) approach, a plan for meeting goals, measures that will be used to assess status of attaining goals, and the rationale for determining reduced and minimized exposures.
III.2.7 Labor Relations Requirements	N 440.1	5.e: Modify the requirements of this Notice for a contractor or subcontractor when necessary to accommodate the obligations of a contractor whose employees are represented for collective bargaining purposes by a labor organization consistent with with the requriements of the National Labor Relations Act.

III.2.8 Qualified Personnel	O 440.1	4.c: Use qualified worker protection staff to direct and manage the worker protection program. Attachment 2, 17.k: Professionally and technically qualified industrial hygienists to manage and implement the industrial hygiene program. Attachment 2, 18. i.(1): The physician responsible for the delivery of medical services shall be a graduate of a school of medicine or osteopathy who meets the licensing requirements applicable to the location in which the physician works. Attachment 2, 18. i.(2): Occupational medical physicians, occupational health nurses, physician's assistants, nurse practitioners, psychologists, and other occupational health personnel shall be graduates of accredited schools and shall be licensed, registered, or certified as required by Federal or State law where employed.
	N 440.1	3.a.: Conduct comprehensive inventory and hazard assessments for beryllium by qualified personnel to ensure that workers not involved with beryllium activities or processes and the public are not exposed to beryllium. Attachment 2, 5.: Ensure all aspects of the CBDPP are managed and implemented by professionally and technically qualified industrial hygienists and medical personnel.
	G 440.1-4	4.8.1: Physicians who are providing occupational medical services to contractor employees need to have a degree from an accredited school of medicine or osteopathy and meet the licensing requirements applicable to the locations in which they work. Board certification in occupational medicine is preferred. It is desirable that the responsible physician report to the contractor site manager, appropriate laboratory director, or another management level with sufficient authority to participate in health and environmental issues at policy-making levels to ensure program effectiveness. They should be afforded opportunities for continuing education, including attendance at professional meetings. 4.8.2: It is recommended that occupational health nurses, physician's assistants, nurse practitioners, and other occupational health personnel be graduates of accredited schools, licensed, registered, or certified, and legally qualified to practice by Federal or State law where employed. They should be afforded opportunities for continuing education, including attendance at professional meetings.

	Std-xxxx-97	5.11.1: An effective Worker Protection Program must have access to competent industrial hygienists. The qualifications for industrial hygiene staff are described in the *DOE Department-Wide Functional Area Qualification Standard: Industrial Hygiene Qualification Standard.* Management should ensure that its industrial hygiene staff: a. Is adequately trained in the anticipation, recognition, evaluation, and control of hazardous and potentially hazardous occupational exposures and b. Has the support necessary to maintain and enhance the staff's proficiency in industrial hygiene through continued training, professional education, and professional activities (e.g., the professional certification process). Because industrial hygienists have widely varying backgrounds, experience, talent, and education, their development programs should be individualized. Within the Worker Protection field, opportunities exist for cross-training among the various disciplines. For example, and industrial hygienists may benefit from cross-training in health physics, environmental protection, occupational safety, and waste management, as well as from management training in administration, budgeting, and strategic planning. The industrial hygiene aspects of the worker protection program should be directed by a senior industrial hygienist with appropriate experience, who should report directly to a senior member of management. A senior industrial hygienist is a person who is certified in the practice of industrial hygiene or who meets the American Board of Industrial Hygiene's (ABIH's) requirements for certification. At a minimum, such individuals must have a college or university degree in industrial hygiene, chemistry, physics, medicine, biology, chemical, mechanical, or sanitary engineering; special studies and training; and 5 years of full-time employment in the professional practice of industrial hygiene. (See the ABIH *Bulletin* for detailed requirements for certification or eligibility for certification.)
IV.1.1 Baseline Inventory	O 440.1	4.i: Identify existing and potential workplace hazards and evaluate the risk of associated worker injury or illness. Attachment 1, 5.a: Initial or baseline surveys of all work areas or operations to identify and evaluate potential worker health risks.
	N 440.1	Attachment 1,1: Develop a baseline inventory of beryllium locations and operations; identify exposed and potentially exposed workers by location; and conduct sampling.
	G 440.1-3	4.3.1: (The section provides guidance about initial hazard identification as the first step in determining potential worker exposures.)
	Std-xxxx-97	1.1: Initial or baseline surveys of all work areas or operations to identify and evaluate potential worker health risks.

IV.1.2 Sampling	O 440.1	4.i.2-3: Assess worker exposure to chemical, physical, biological, or ergonomic hazards through appropriate workplace monitoring (including personal, area, wipe, and bulk sampling), biological monitoring, and observation. Monitoring results shall be recorded. Documentation shall describe the tasks and locations where monitoring occurred, identify workers monitored or represented by the monitoring, and identify the sampling methods and durations, control measures in place during monitoring (including the use of personal protective equipment), and any other factors that may have affected sampling results. Evaluate workplaces and activities accomplished routinely by workers, supervisors, and managers and periodically by qualified worker protection professionals. Attachment 1, 5.a,c and d: Initial or baseline surveys of all work areas or operations to identify and evaluate potential worker health risks. Periodic resurveys and/or exposure monitoring as appropriate. Documented exposure assessment for chemical, physical, and biological agents and ergonomic stressors using recognized exposure assessment methodologies and use of accredited industrial hygiene laboratories.
	N 440.1	Attachment 1, 1: Develop a baseline inventory of beryllium locations and operations; identify exposed and potentially exposed workers by location; and conduct sampling.
	G 440.1-3	4.3.3: (The section provides guidance about conducting qualitative exposure monitoring, including development of exposure profiles, identification of exposure groups, and use of administrative control limits.)
	Std-xxxx-97	1.1.1 - 1.1.4: For operations identified as having potential occupational health hazards, surveys should include: Assessment of the hazardous or potentially hazardous employee exposures . . . Measurements and observations adequate to assess compliance with applicable exposure limits . . . Personal monitoring for airborne contaminants meeting the specifications of paragraph 1.4 of this section using breathing zone samples that reflect the 8-hour, time-weighted average exposures (TWA), TWA excursions, short-term exposures, or ceiling exposure of the employee, as appropriate . . . Sampling and analysis using the methods specified by OSHA or the National Institute for Occupational Safety and Health (NIOSH) or by other methods documented to be at least as accurate as the OSHA or NIOSH methods. 1.3: Periodic resurveys and/or exposure monitoring as appropriate.
IV.2 Hazard Assessment	O 440.1	4..i.(1): Analyze or review: (a) designs for new facilities and modifications to existing facilities and equipment; (b) operations and procedures; and (c) equipment, product, and service needs. 4.i.(3): Evaluate workplaces and activities accomplished routinely by workers, supervisors, and managers and periodically by qualified worker protection professionals. 4.i.(4): Report and investigate accidents, injuries, and illnesses (reference DOE O 231.1, 232.1, and 225.1) and analyze related data for trends and lessons learned (reference DOE O 210.1).
	N 440.1	Attachment 1, 2a.-c.: a. Conduct a beryllium hazard assessment and determine whether in-depth analysis is warranted...b. Conduct in-depth analysis, where appropriate, to ascertain the nature of the exposure risk to beryllium... c. Include in the beryllium hazard assessment an analysis of existing conditions, exposure data, medical surveillance trends, and the exposure potential of planned activities.

	G 440.1-1	4.3.1: (This section discusses the types of analyses and reviews that can be useful in identifying and evaluating hazards.) 4.3.3: (This section gives guidance on effective approaches to routine evaluation of workplaces and activities.)
	G 440.1-3	4.3.3: (The section provides guidance about conducting qualitative exposure monitoring, including development of exposure profiles, identification of exposure groups, and use of administrative control limits.)

	Std-xxxx-97	1.2: Coordination with planning and design personnel to anticipate and control health hazards that proposed facilities and operations would introduce. 1.4.1 - 1.4.3 Develop and maintain written health hazard assessment and control records for potentially hazardous exposures identified in the health hazard assessments and all health hazard prevention and control measures . . . The health hazard assessment and control records should include the following operational, administrative, hazard, hazard control, and employee data . . . For those work operations initially identified as having the potential for hazardous exposure but subsequently determined in the hazard assessment not to pose a health hazard, management should include the following in the health hazard assessment and control records . . .
IV.3 Exposure Monitoring	O 440.1	4.i.(2): Assess worker exposure to chemical, physical, biological, or ergonomic hazards through appropriate workplace monitoring (including personal, area, wipe, and bulk sampling), biological monitoring, and observation. Monitoring results shall be recorded. Documentation shall describe the tasks and locations where monitoring occurred, identify workers monitored or represented by the monitoring, and identify the sampling methods and durations, control measures in place during monitoring (including the use of personal protective equipment), and any other factors that may have affected sampling results. Attachment 1, 5c: Periodic resurveys and/or exposure monitoring as appropriate.
	N 440.1	Attachment 1, 3.a-f and Attachment 2, 7.c.(1)-(6): (1): Identify the operations and areas in which workers must be monitored...Conduct personal breathing zone sampling for all workers exposed and potentially exposed to beryllium, or provide the rationale for monitoring a limited subset of workers...Conduct area sampling where appropriate to determine operational control...Conduct surface sampling to determine housekeeping conditions and to identify contamination that has the potential to become airborne...Establish the required frequency of monitoring by using a risk-based (tailored) approach...Require additional monitoring when warranted due to changes in operations or procedures, or as necessary to ensure that exposure reduction and minimization goals are met.
	G 440.1-3	4.2-4.4: (These sections contain guidance about exposure assessment approaches, conducting qualitative exposure assessments, and conducting quantitative exposure assessments.)

	Std-xxxx-97	1.1.3: Personal monitoring for airborne contaminants meeting the specifications of paragraph 1.4 of this section using breathing zone samples that reflect the 8-hour, time-weighted average exposures (TWA), TWA excursions, short-term exposures, or ceiling exposure of the employee, as appropriate 1.1.4: . . . Surveys should include . . . sampling and analysis using methods specified by OSHA or the National Institute for Occupational Safety and Health (NIOSH) or by other methods documented to be at least as accurate as the OSHA or NIOSH methods. 1.1.5: . . . Surveys should include . . . interpretation of personal monitoring results by the senior industrial hygienist or staff industrial hygienist(s) in a manner that is consistent with the procedures included in the OSHA "Field Operations Manual," "Field Inspection Reference Manual," and "Technical Manual." 1.3: The frequency of health hazard assessments should be proportional to the risk presented by the hazard as determined by the senior industrial hygienist. Industrial areas (e.g., research and development facilities, general industry areas, craft shops) should be evaluated at least annually, and more often if potentially severe health hazards are present. New and changed operations should be evaluated when started. Frequently changing work sites (e.g., construction sites and hazardous waste sites) should be evaluated as often as necessary. Low-hazard areas (e.g., ordinary offices and non-hazardous facilities) should be evaluated at least every three years or in accordance with applicable regulatory requirements. Unoccupied buildings should be evaluated initially and thereafter as frequently as deemed necessary.
IV.3.3.1 Personal Air Monitoring	N 440.1	Attachment 1,3.b., f. and Attachment 2, 7.c.(2), (6): Conduct personal breathing zone sampling for all workers exposed and potentially exposed to beryllium, or provide the rationale for monitoring a limited subset of workers...Require additional monitoring when warranted due to changes in operations or procedures, or as necessary to ensure that exposure reduction and minimization goals are met.
IV.3.3.2 Area Air Monitoring	N 440.1	Attachment 1,3.c. and Attahcment 2, 7.c.(3): Conduct area sampling where appropriate to determine operational control.
IV.3.3.3 Surface Monitoring	N 440.1	Attachment 1, 3.d and Attachment 2, 7.c.(4): Conduct surface sampling to determine housekeeping conditions and to identify contamination that has the potential to become airborne.

IV.4 Exposure Reduction and Minimization	O 440.1	4.j: Implement a hazard prevention/abatement process to ensure that all identified hazards are managed through final abatement or control. 4.j(1): For hazards identified either in the facility design or during the development of procedures, controls are incorporated in the appropriate facility design or procedure. 4.j(2): For existing hazards identified in the workplace, abatement actions prioritized according to risk to the worker are promptly implemented, interim protective measures are implemented pending final abatement, and workers are protected immediately from imminent danger conditions. 4.j(3): Hazards are addressed when selecting or purchasing equipment, products, and services. 4.j(4): Hazard control methods are selected based on the following hierarchy: (a) Engineering controls. (b) Work practices and administrative controls that limit worker exposures. (c) Personal protective equipment. 4.l(1): Comply with the following worker protection requirements: American Conference of Governmental Industrial Hygienists (ACGIH), "Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices" (most recent edition), when ACGIH Threshold Limit Values (TLVs) are lower (more protective) than Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits. [When ACGIH TLVs are used as exposure limits, DOE operations shall nonetheless comply with the other provisions of any applicable OSHA-expanded health standard.] The TLVs for exposures to laser emissions in the ACGIH Indices are excluded from this requirement. Attachment 1, 5.b: . . . Industrial hygiene programs shall include . . . coordination with planning and design personnel to anticipate and control health hazards that proposed facilities and operations would introduce. Attachment 1, 5.e: Specification of appropriate engineering, administrative, work practice, and/or personal protective control methods to limit hazardous exposures to acceptable levels. Attachment 2, 12.a,e: Comply with the following worker protection requirements: a. Title 29 of the Code of Federal Regulations (CFR), Part 1910, "Occupational Safety and Health Standards," . . . e. Title 29 CFR, Part 1926, "Safety and Health Regulations for Construction."

	N 440.1	Attachment 1,4.a-e and Attachment 2, 7. d. (1)-(5): Elements of reduction and minimization strategies include: Developing a documented program that includes exposure reduction and minimization goals using a risk-based (tailored) approach, a plan for meeting goals, measures that will be used to assess status of attaining goals, and the rationale for determining reduced and minimized exposures...Using administrative action levels that trigger actions to reduce or minimize worker exposure and the potential for exposures...Establishing contamination control to preclude exposures to the extent practical...Implementing work control strategies to reduce exposures to as low as practical using the established hierarchy of industrial hygiene controls (i.e., engineering and administrative controls, and personal protective equipment) to reduce the potential for worker exposure...Documenting the rationale used for determining reduced and minimized exposures.
	G 440.1-1	4.4: (This section contains guidance for implementing a hazard prevention/abatement process to ensure that all identified hazards are managed through final abatement or control.)
	G 440.1-3	4.5.1.2: (This section explains how exposure reduction goals for individuals and groups should be established and tracked for each significant risk group to help reduce exposures. It gives some suggested questions that should be considered in measuring management's performance in conducting exposure assessment.)
	Std-xxxx-97	1.1.2: Measurements and observations adequate to assess compliance with applicable exposure limits. This can include personal, area, wipe, and bulk sampling; biological monitoring; and ergonomic observation. 1.5.1: Prevention and control measures should be implemented whenever a hazardous or potentially hazardous exposure exists. 1.5.2: The senior industrial hygienist should recommend to facility management prevention and control measures required to reduce the hazardous exposures of employees.
IV.4.3.1 Goals, Plans, and Performance Measures	O 440.1	4.b: Establish written policy, goals, and objectives for the worker protection program.
	N 440.1	Attachment 1, 4 and Attachment 2, 7.d.: Exposure Reduction and Minimization. Manage and control exposures to beryllium by: reducing airborne levels of beryllium, minimizing the number of workers exposed and potentially exposed to beryllium, minimizing the number of opportunities to be exposed, and setting reasonable exposure reduction goals using a risk-based (tailored) approach. Attachment 1, 4.a and Attachment 2, 7.d.(1): Developing a documented program that includes exposure reduction and minimization goals using a risk-based (tailored) approach, a plan for meeting goals, measures that will be used to assess status of attaining goals, and the rationale for determining reduced and minimized exposures.
	G 440.1-3	4.5.1.2: (This section explains how exposure reduction goals for individuals and groups should be established and tracked for each significant risk group to help reduce exposures. It gives some suggested questions that should be considered in measuring management's performance in conducting exposure assessment.)

IV.4.3.2 Administrative Action Levels	N 440.1	Attachment 1, 4.b and Attachment 2, 7.d.(2): Using administrative action levels that trigger actions to reduce or minimize worker exposure and the potential for exposures.
	G 440.1-3	4.3.3.2 and Appendix C: (This section and appendix explain the concept of administrative control limits and give a practical example for using them.)
IV.4.3.3.1 Engineering Controls	O 440.1	4.j(4)(a): Hazard control methods are selected based on the following hierarchy: Engineering controls, . . .
	N 440.1	Attachment 1, 4.d and Attachment 2, 7.d.(4): Implementing work control strategies to reduce exposures to as low as practical using the established hierarchy of industrial hygiene controls (i.e., engineering and administrative controls, and personal protective equipment) to reduce the potential for worker exposure.
	G 440.1-1	4.4.4.1: Where controls are necessary to reduce worker risk from exposure to workplace hazards, engineering controls should be implemented to the extent feasible. Principal engineering controls include: substituting a less hazardous substance or process, enclosing a hazard, locating hazardous operations or equipment in remote and/or unoccupied areas, establishing physical barriers and guards, and using local and general exhaust ventilation.
	G 440.1-3	4.5.3: (This section discusses the role of exposure assessment in exposure prevention and hazard control.)
	Std-xxxx-97	1.5.3(1): Engineering controls: (a) Change to a less hazardous process or substitute a less hazardous material. (b) Isolate or enclose the process or operation to prevent worker exposure. (c) Use ventilation controls or other engineering controls to prevent or reduce worker exposure.
IV.4.3.3.2 Administrative Controls	O 440.1	4.j(4)(b): Work practices and administrative controls that limit worker exposures.
	N 440.1	Attachment 1, 4.d and Attachment 2, 7.d.(4): Implementing work control strategies to reduce exposures to as low as practical using the established hierarchy of industrial hygiene controls (i.e., engineering and administrative controls, and personal protective equipment) to reduce the potential for worker exposure.
	G 440.1-1	4.4.4.2: The effectiveness of work practice and administrative controls depends on the ability of line management to make employees aware of established work practices and procedures, to reinforce them, and to provide consistent and reasonable enforcement. Administrative controls include: written operating procedures, safety work practices, and work permits; exposure time limitations; limits on the use of hazardous materials and monitoring of such operations; health and safety plans; altered work schedules, such as working in the early morning or evening to reduce the potential for heat stress; and training employees in methods of reducing exposure.
	G 440.1-3	4.5.3: (This section discusses the role of exposure assessment in exposure prevention and hazard control.)
	Std-xxxx-97	1.5.3(2): Work practice and administrative controls that limit worker exposures: (a) Develop work practices and procedures (e.g., standard operating procedures, limited access) to reduce or eliminate hazardous exposures. (b) Maintain administrative controls (e.g., performance of hazardous activities during periods when few employees are present).

IV.4.3.3.3 Personal Protective Equipment	O 440.1	4.j(4)(c): Personal protective equipment. 4.l(3): Comply with . . . American National Standards Institute Z88.2, "Practices for Respiratory Protection."
	N 440.1	Attachment 1, 4.d and Attachment 2, 7.d.(4): Implementing work control strategies to reduce exposures to as low as practical using the established hierarchy of industrial hygiene controls (i.e., engineering and administrative controls, and personal protective equipment) to reduce the potential for worker exposure.
	G 440.1-1	4.4.4.3: When engineering and/or administrative controls have been considered and implemented and are not sufficient to fully protect the worker from a recognized hazard, personal protective equipment can be used to supplement these other controls as appropriate. PPE is acceptable as a control method: to supplement engineering, work practice, or administrative controls when such controls are not feasible or do not adequately reduce the hazard; as an interim measure while engineering controls are being developed and implemented; during emergencies when engineering controls may not be feasible; and during maintenance and other non-routine activities where other controls are not feasible. The use of PPE can itself create significant worker hazards, such as heat stress, physical and psychological stress, and impaired vision, mobility, and communication. An example would be a worker wearing several layers of clothing (for warmth and anti-contamination), a respirator, gloves, and a helmet while welding or cutting. This arrangement of PPE could prevent the worker from being aware of the environment in the event of a fire or other emergency. Research has also confirmed that fabric assemblies with high percentages of cotton fiber in their outer wear and/or underwear layers and no air space between layers yielded the highest maximum heat transfer rate and total heat transfer. These assemblies have more burn potential than assemblies containing higher amounts of polyester and more space between layers. In these situations, engineering and/or administrative controls (e.g., a fire watch to ensure the safety of the worker as well as the property) should be implemented to supplement PPE. Equipment and clothing should be selected that provide an adequate level of protection. The selection process should involve representatives of the affected safety disciplines (e.g., health physicist, industrial hygienist, fire protection staff, etc.) working in concert. Two basic objectives of any PPE practice should be to protect the wearer from safety and health hazards, and to prevent injury to the wearer from incorrect use and/or malfunction of the PPE. To accomplish these objectives, a comprehensive PPE practice should include hazard identification (hazards that PPE will protect against and hazards caused by the use of PPE), medical monitoring, environmental surveillance, selection, use, maintenance, and decontamination of PPE and its associated training.
	G 440.1-3	4.5.3: (This section discusses the role of exposure assessment in exposure prevention and hazard control.)
	Std-xxxx-97	1.5.3(3): Use personal protective equipment. However, compliance with applicable exposure limits can not be achieved with the use of respiratory protective equipment except...

IV.5 Medical Surveillance	O 440.1	Attachment 2, 18.c(1)(c)-(e): Occupational medical physicians and selected medical staff shall: . . . (c) perform targeted examinations based on an up-to-date knowledge of work site risk,. . . (d) identify potential or actual health effects resulting from work site exposures, and (e) communicate the results of health evaluations to management and to those responsible for mitigating work site hazards. Attachment 2, 18.d(1): Health examinations shall be conducted by an occupational health examiner under the direction of a licensed physician in accordance with current sound and acceptable medical practices. Attachment 2, 18.d(2): The content of health examinations shall be the responsibility of the physician responsible for delivery of medical services. Attachment 2, 18.d(3)(d): The following classes of examinations are required . . . medical surveillance and health monitoring. Attachment 2, 18.d(4): The occupational medical department shall be informed of all job transfers and shall determine whether a medical evaluation is necessary. Attachment 2, 18.e(1): The occupational medical program shall be responsible for the review of all monitored care of ill and injured employees to maximize their recovery and safe return to work, and to minimize lost time and its associated costs. Attachment 2, 18.g(1)-(3): An employee medical record shall be developed and maintained for each employee for which medical services are provided. The confidentiality of all employee medical records shall be observed. Employee medical records shall be adequately protected and stored permanently.
	N 440.1	Attachment 1, 5.a.-d. and Attachment 2, 7.e.(1)-(4): Offer to enroll in a medical surveillance program all workers at risk for chronic beryllium disease (CBD) due to either past or current potential exposure to beryllium...Maintain an updated roster of workers at risk for CBD...Conduct pulmonary medical histories and lung function tests as part of the preplacement examination for workers to be assigned to beryllium areas. If the occupational medicine physician concludes that the medical history and the lung function test results warrant a chest x-ray, it must be offered to the worker...Provide on a voluntary basis, beryllium-specific peripheral blood lymphocyte proliferation testing, or other available preferred beryllium-specific tests considered appropriate by an occupational medicine physician, to screen for beryllium sensitization and provide early detection of CBD. Physicians must notify workers of the procedures and associated risks of the tests...Workers' occupational histories and clinical stages of the disease must be included in investigation reports of recordable beryllium disease (see DOE Order 231.1). Contact DOE (EH-6) for guidance on the content of the reports. Send copies of reports to DOE (EH-6).
	G 440.1-3	4.5.2: (This section discusses the role of exposure assessment in occupational medicine and medical monitoring.)

	G 440.1-4	4: (This section contains guidelines for an occupational medical program, including implementation of an onsite program, maintenance of a healthful work environment, employee health evaluations, diagnosis and treatment of injury or disease, medical records, organization, staffing, facilities, and equipment.) 4.3.2: The medical professional responsible for the occupational medical program should have responsibility for health evaluation content. Initial or baseline evaluations should be comprehensive, and follow-up evaluations should be additionally targeted as determined by employee exposure data, job task and hazard analysis information, or other occupationally related factors. Minimum elements of a comprehensive evaluation are: medical/occupational history, physical examination, laboratory studies, and review and evaluation of findings. The protocols for x-ray examinations should follow the recommendations and guidance contained in 43 FR 4377, dated 2-1-78. All radiographs should be interpreted by a qualified radiologist or as specified by OSHA/DOE. 4.3.3.2: Standards and requirements for special health evaluations and health monitoring of employees who work in jobs involving specific physical, chemical, or biological hazards should be in accordance with applicable OSHA/DOE standards. When employees are exposed to potential hazards not covered by regulations, appropriate special evaluations may be required as determined by the physician responsible for medical services and approved by the DOE Director, Office of Occupational Medicine and Medical Surveillance. 4.3.3.5: All employees with occupationally related injuries or illnesses should be evaluated before returning to work. The scope and content of this evaluation should be determined by the OHE, based upon the nature and extent of the injury or disease, and should be sufficient to ensure that the employee may return to work without undue health risk to self or others. The employee should obtain written clearance from the occupational medical department before returning to work. 4.4.1: The management of occupational injury or disease should be in accordance with the laws and regulations of the state in which the facility is located. Diagnosis and treatment of occupational injury or disease should be prompt, with emphasis placed on rehabilitation and return to work at the earliest time compatible with job safety and employee health. Contractor management has the responsibility to establish procedures to ensure that all employees with occupational injuries or illnesses receive medical clearance before returning to work. The responsible first-line management and health and safety groups (health physics, industrial hygiene, or safety) should be notified of unhealthy work situations detected by the occupational medical staff.
	Std-xxxx-97	1.7: Coordination with cognizant occupational medical, environmental, health physics, and work planning professionals . . . The senior industrial hygienist recommends employees to be included in medical surveillance and participates in the review of occupational exposure and medical surveillance data.
IV.6 Training	O 440.1	4.k: Provide workers, supervisors, managers, visitors, and worker protection professionals with worker protection training. Attachment 1, 5.f: Industrial hygiene programs shall include the following elements: . . . Worker education, training, and involvement.

	N 440.1	Attachment 1, 6 and Attachment 2, 7.f.: Implement a training program that provides workers exposed and potentially exposed to beryllium, and supervisors, managers, medical personnel, industrial hygienists, and others involved in beryllium activities and processes, with information concerning the proper handling and control of beryllium, hazards of exposure to beryllium, controls (e.g., engineering, administrative, and personal protective equipment) and work practices of the job assignment, minimization of worker exposure, the purpose and use of personal protective equipment, medical monitoring, and waste management and decontamination procedures.
	G 440.1-1	4.5: (This section contains guidance on providing worker protection training and refers to other training requirements in DOE O 360.1 and 29 CFR 1960, Subpart H.)
	Std-xxxx-97	1.6: Employees should be trained in: (1) Methods and observations that may be used to detect the presence of an occupational health hazard in the work area . . . (2) An understanding of the physical and health hazards of the hazardous chemicals, harmful physical agents, ergonomic stressors, and harmful biological agents in the work area. (3) The measures employees can take to protect themselves from these hazards . . . (4) The details of the hazard communication program developed by DOE or the contractor . . . and (5) The details of hazard-specific training programs mandated by DOE-prescribed industrial hygiene requirements.
IV.7 Recordkeeping	O 440.1	4.i(4): Report and investigate accidents, injuries, and illnesses (reference DOE O 231.1, 232.1, and 225.1) and analyze related data for trends and lessons learned (reference DOE O 210.1).
	N 440.1	Attachment 1, 7 and Attachment 2, 7.g.: Maintain records of all beryllium inventory information, hazard assessments, exposure measurements, controls, and medical surveillance pursuant to DOE Order 440.1, paragraph 4.i.(2), to demonstrate program effectiveness... Maintain the records in an electronic, easily retrievable manner for transmittal to DOE Headquarters on request... Create links between data sets on working conditions and health outcomes to serve as a basis for understanding the beryllium health risk.
	G 440.1-1	4.3.4: (This section contains guidance on recordkeeping, reporting, and data analysis for accidents, injuries, and illnesses.)
	Std-xxxx-97	1.4: Documented exposure assessment for chemical, physical, and biological agents and ergonomic stressors using recognized exposure assessment methodologies and accredited industrial hygiene laboratories. Develop and maintain written health hazard assessment and control records for potentially hazardous exposures identified in the health hazard assessments and all health hazard prevention and control measures . . . The health hazard assessment and control records should include the following operational, administrative, hazard, hazard control, and employee data . . . The monitoring records documenting hazardous exposures, which should include . . . A description of the specific means that were used to achieve or maintain compliance with applicable DOE-prescribed industrial hygiene requirements . . . A description of any control technology in place or to be installed and documentation of its efficacy or justification for using controls other than engineering controls to achieve compliance . . . and . . . A detailed schedule for, and regular process reports on , the implementation of required health hazard prevention and control measures, as required by DOE-prescribed industrial hygiene requirements.

IV.8 Performance Feedback	O 440.1	4.i(4): Report and investigate accidents, injuries, and illnesses (reference DOE O 231.1, 232.1, and 225.1) and analyze related data for trends and lessons learned (reference DOE O 210.1). Attachment 1, 5.g: Industrial hygiene programs shall include . . . coordination with cognizant occupational medical, environmental, health physics, and work planning professionals. Attachment 2, 18.c(1)(a),(e): Occupational medical physicians and selected medical staff shall: (a) coordinate with other safety and health professionals (industrial hygienists, health physicist, safety specialists/managers) to identify work-related or work site hazards and their possible health risks to employees, . . . (e) communicate the results of health evaluations to management and to those responsible for mitigating work site hazards. Attachment 2, 18.c(2)(a)-(c): Contractor management shall provide to the physician responsible for delivery of medical services: (a) employee job task and hazard analysis information; (b) summaries of potential work site exposures of employees prior to mandatory health examinations; and (c) the opportunity to participate in worker protection team meetings and committees.
	N 440.1	Attachment 1, 8 and Attachment 2, 7.h.: Conduct periodic analysis and assessment of monitoring results, hazards identified, medical surveillance results, attainment of exposure reduction and minimization goals, and occurrence reporting data...Feed back results to line managers, planners, worker protection staff, workers, medical staff, and others to ensure that needed information is available to improve all elements of the CBDPP continuously.
	G 440.1-1	4.3.4: (This section contains guidance on recordkeeping, reporting, and data analysis for accidents, injuries, and illnesses.)
	Std-xxxx-97	2.1-2.1: Management should annually perform and document self-assessments to ensure the effectiveness of industrial hygiene functions . . . Management should correct any occupational health deficiencies identified by the program self-assessment.

* DOE O 440.1 *Worker Protection Management for DOE Federal and Contractor Employees*
DOE N 440.1 *Interim Chronic Beryllium Disease Prevention Program*
DOE G 440.1-1 *Worker Protection Management for DOE Federal and Contractor Employees Guide*
DOE G 440.1-3 *Occupational Exposure Assessment (Draft), June 19, 1997*
DOE G 440.1-4 *Occupational Medical Program*
DOE Std-xxxx-97 *Industrial Hygiene Practices (Draft), August, 1997*